<u>REMARKS/ARGUMENTS</u>

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Claims 1-19 are currently pending in the application; no claim amendments are presented. Thus, no new matter is added.

By way of summary, the Official Action presents the following issues: objection to Figures 1a and 1b; Claims 1-4, 13, 15-17 and 19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicant's admitted prior art (AAPA) in view of <u>Pastor et al.</u> (U.S. Patent No. 6,438,513, hereinafter "the '513 patent"), and in further view of <u>Yamaguchi et al.</u> (U.S. Patent No. 6,026,359, hereinafter "the '359 patent"); Claim 7 was rejected under 35 U.S.C. § 103(a) as being unpatentable over AAPA in view of the '513 patent and the '359 patent, and in further view of <u>Pastor et al.</u> (U.S. Patent 6,445,801, hereinafter "the '801 patent"); Claim 14 was rejected under 35 U.S.C. § 103(a) as being unpatentable over AAPA in view of the '513 patent and the '359 patent, and in further view of <u>Takahashi et al.</u> (U.S. Patent No. 5,739,891, hereinafter "the '891 patent"); and Claims 5, 6, 8-12 and 18 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims.

Applicant gratefully acknowledges the indication of allowable subject matter. However, since Applicant considers that independent Claims 1 and 16 patentably define over the prior art, the remaining dependent claims have been presently maintained in dependent form.

The Official Action has rejected independent Claims 1 and 16 under 35 U.S.C. § 103(a) as being unpatentable over AAPA in view of the '513 patent and in further view of the '359 patent.

The Official Action cites AAPA and the '513 patent as teaching the claimed invention with the exception of including a step of matching the parameters to the new noise model in the parameterizing step. The Official Action cites the '359 patent as disclosing a step of matching the parameters to the new noise model and states that it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references to arrive at the claimed invention. Applicant respectfully traverses the rejection.

Briefly, recapitulating, the present invention relates to a method and apparatus for performing voice recognition of a noise-ridden acoustic signal. Specifically, Claim 1 is directed to digitizing and subdividing a received noise-ridden acoustic signal into a sequence of temporal frames. The temporal frames are then parameterized to obtain a vector of parameters, per frame in the frequency domain, the vector of parameters expressing the acoustic contents of this frame. The method also includes a step of reiterative searching for successive noise models in the sequence of temporal frames, a new noise model replacing a current noise model when a noise transition between the new noise model and the current noise model occurs. Then, when the noise transition has been detected, the reference base is updated as a function in the new noise model and the parameterizing step includes a step of matching the parameters of the received noise-ridden acoustic signal to the new noise model.

Claim 1 recites, *inter alia*, a method of voice recognition in a noise-ridden acoustic signal comprising:

> "...a step of parameterizing speech-containing temporal frames so as to obtain a vector of parameters, per speech containing frame, in the frequency domain, the vector of parameters expressing the acoustic contents of each speech containing frame...
> ...the parameterizing step including a step of matching the parameters to the new noise model."

The '359 patent describes a scheme for model adaptation in pattern recognition based on Taylor expansion.

Specifically, the '359 patent describes that a processing unit is used to update the initial noisy speech Hidden Markov Model (HMM) based on the Taylor expansion using the obtained difference in the Jacobian matrices is carried out by a noisy speech HMM updating unit (10) so as to calculate the adapted noisy speech HMMs in approximation, in the obtained adapted noisy speech HMMs are stored in an adapted noisy speech HMM memory unit (11). Then, the recognition processing of the input noisy speech is carried out at a speech recognition unit (12) by using the adapted noisy speech HMMs, and an obtained recognition result is outputted a recognition result output unit (13).[1] The '359 patent also describes that at the time of actual recognition, a noise data is extracted at the noise extraction unit (2) from an input noisy speech entered at the speech input unit (1) as the adaption target noise HMM, and when there is a mismatch between the input noisy speech and the initial noisy speech HMMs, a difference between the adaption target noise HMM and the initial noise HMM is obtained at a difference calculation unit (9).[2]

The requirements for a *prima facie* case of obviousness are (1) there must be some suggestion or motivation in the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify the reference or to combine the reference teachings, (2) there must be a reasonable expectation of success, and (3) the prior art reference must teach or suggest all the claim limitations. It is respectfully submitted that the outstanding Official Action fails to make a *prima facie* case of obviousness, because the prior art references neither combined, nor individually, teach or suggest all the claim limitations.

Claim 1 recites, "the parameterizing step including a step of matching the parameters to the new noise model." The '359 patent describes that various new noise models are generated each time noisy speech is input, and that a noise model is generated based on a probability calculation then compared to a currently stored noise model. If the new noise

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[1] The '359 patent at column 11 lines 45-56.
[2] The '359 patent at column 11 lines 38-34.

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model differs from the previous noise model the new noise model is stored and then the

recognition processing of the input noisy speech is carried out at a speech recognition unit

(12) by using the adapted noisy speech HMMs. Thus, the '359 patent fails to teach or

suggest a step of parameterizing speech-containing frames to obtain a vector of parameters,

per speech containing frame, in the frequency domain, the vector of parameters expressing

the acoustic contents of each speech-containing frame, as recited in Claim 1. Further, the

'359 patent fails to teach or suggest that the parameterizing step further includes a step of

matching the parameters to a new noise model. In this regard, the '359 patent fails to teach or

suggest that the received noisy-voice input is parameterized. Thus, the '359 patent cannot be

reasonably construed to teach that such a missing parameterizing step includes the step of

matching the parameters to a new noise model, as recited in amended Claim 1.

It appears that the outstanding action suggests that the teachings of the '359 patent can

be generalized and taken in the abstract apart from the context of the '359 patent to create all

encompassing teachings to modify the other references. This approach is contrary to

precedent, see In re Kotzab, 55 USPQ2d 1313, 1317 as follows:

> While the test for establishing an implicit teaching, motivation, or suggestion is what
> the ... statements of [the reference] would have suggested to those of ordinary skill in
> the art, the ... statements cannot be viewed in the abstract. Rather, they must be
> considered in the context of the teaching of the entire reference.

Accordingly, Applicant requests that the rejection of Claim 1 under 35 U.S.C. §

103(a) be withdrawn. For substantially the same reasons as given with respect to Claim 1, it

is also submitted that Claim 16 patentably defines over the applied prior art. As Claims 2-4,

13 and 15 depend from Claim 1 it is respectfully submitted that these claims also patentably

define over the prior art. Further, as Claims 17 and 19 depend from Claim 16 it is

respectfully submitted that this claim also patentably defines over the prior art.

As discussed above, AAPA neither alone nor in combination with the '513 patent or

the '359 patent disclose or suggest the Applicants' parameterizing step including a step of

matching the parameters to the new noise model, as recited in independent Claims 1 and 16.

Likewise, the '801 and the '891 patent fail to remedy this deficiency, and therefore none of

the cited references either alone nor in combination disclose or suggest Applicants' Claims 7

and 14 which include the above distinguished limitations by virtue of dependency.

Therefore, the Official Action does not provide a *prima facie* case of obviousness with regard

to any of these claims. Accordingly, Applicant respectfully requests that the rejection of

Claims 7 and 14 under 35 U.S.C. § 103 be withdrawn.

Consequently, in light of the foregoing comments, it is respectfully submitted that the

invention defined by Claims 1-19 is patentably distinguishing over the prior art. The present

application is therefore believed to be in condition for formal allowance and an early and

favorable reconsideration of the application is therefore requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.

Gregory J. Maier
Attorney of Record
Registration No. 25,599

Raymond F. Cardillo, Jr.
Registration No. 40,440

Customer Number

22850

Tel: (703) 413-3000
Fax: (703) 413-2220
(OSMMN 06/04)

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